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ABSTRACT TITLE:

GEO/SAMS - The Geostationary Synthetic Aperture Microwave Sounder

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ABSTRACT TEXT:

Text block boundaries are fixed. Abstract cannot exceed boundaries.

GEO/SAMS represents a new concept for obtaining microwave soundings of the atmosphere from geostationary orbit. Until now this has not been feasible due to the large scanning antenna system required to achieve adequate spatial resolution and coverage, and only IR sounders have been implemented on GOES weather satellites. The utility of IR-only soundings for numerical weather prediction is limited, due to the inability of IR to penetrate clouds. Adding a microwave sounder will greatly improve GOES capabilites. GEO/SAMS uses a stationary two-dimensional sparse array of receiving elements to synthesize a large aperture. Complex cross-correlations are computed between all possible receiver pairs, essentially yielding the spatial Fourier transform of the radiometric field at a given wavelength. This is inverted on the ground and further processed to yield geophysical parameters. Functionality and performance of GEO/SAMS is similar to that of the latest LEO sounding system, AMSU. Spectral coverage includes 5-6 channels in the 50-57 GHz band, 3-4 channels near 183 GHz and 2-3 channels in window regions. Radiometric accuracy is better than 1 K. This yields tropospheric temperature, water vapor and cloud liquid water profiles, and rain rates. A space demonstration of the GEO/SAMS measurement concept has been proposed to NASA and could be implemented and launched in 3-4 years.

TOPIC PREFERENCE: Special: Synthetic Aperture Microwave Radiometry